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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,149	11/14/2005	Israel Cohen	3562	4855

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EXAMINER	
TAYLOR, VICTOR J	
ART UNIT	PAPER NUMBER
2863	

MAIL DATE	DELIVERY MODE
09/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,149	COHEN ET AL.	
	Examiner	Art Unit	
	Victor J. Taylor	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2005*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-30* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/16/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-30 are pending in the instant application. Therefore, claims 1-30 are presented for examination. This application is a 371 of PCT/US03/36219 11/10/2003 and with priority to US 60/424939 11/09/2002.

Drawings

2. The drawings were received on 11/14/2005. These drawings are approved.

Prior Art

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

I. Trappe et al., US 6,651,006 in 702/14 art A is cited for the method of processing seismic 3D data by conversion of the seismic data into binary data sets defined by predetermined cell size analysis see the subcube 2 inside the cube data set 1, see the geometric approximately cylindrical, ellipsoidal or parallelepiped-shaped cube cells as taught in figure 1.

Wherein, as shown in figure 4, the size of the cell may be selected in any desired magnitude both in the lateral direction (X- and Y-directions) and the vertical direction. The shape of the cell is not fixed either as described in lines 55-65 of column 5. Wherein, because of the three-dimensional matrix of the data points, a squared stone-shaped geometrical shape or cube-shape form of the cell appears preferably. However, the approximately cylindrical, ellipsoidal or parallelepiped-shaped cells may be preselected as well. The selection of the cell

size is dependent upon the geological conditions reflected in the data set, on the one hand, and on the geometric/time matrix spacing of the data points in the data set on the other, see figures 1 and figure 4 in combination with lines 1-55 of columns 5 and 6.

II. Keskes et al., US 6,970,788 in 702/14 art B is cited for the method of keying a borehole in a seismic cube block with steps for correlating seismic recordings obtained in a borehole with the seismic recordings obtained from a volume of subsoil, as taught in the abstract and see the seismic cube and sub-cubes in figure 1. Wherein, the elements in figure 1 shows schematically a portion of a seismic block (seismic cube) presenting steps in space dx and dy in the two horizontal dimensions and a step in time dt in the vertical dimension. An electric signal (Log) is placed in the portion of the block. Also see the parallelepiped cube centered on point U in lines 15-30 of column 4.

Specification

4. The abstract of the disclosure is objected to because the abstract needs to be placed on a single page and limited to 50-150 words. Correction is required. See MPEP § 608.01(b).

5. Claims 1-30 are objected to because of the following informalities:

The wording for the spelling for cube geometric terms concerning "Parallel Piped" seismic data has misspellings of the word in claims 1, 2, 7, 8, 11, 15, 17, 20, and in claim 30 and the terms are not clear and do not appear to have the clear support in the specification for the wording "parallelepiped" shaped cube cells as illustrated in figure 6 and 7 of the instant application.

The examiner request the applicant to review the claims and correct the misspellings show clear support in the specification and identification for the cube and sub-cube data identified as "parallelepiped" in the claims. Appropriate correction is required.

6. The disclosure is objected to because of the following informalities:

The disclosure teaches the analysis volume (cube) broken into two sub-volumes (sub-cubes) that are rotated and tilted about a central analysis point, for example see paragraph 0034 on page 16 of the specification, and teaches the sub-volumes broken from analysis volume data of the three-dimensional matrix of the data points (x, y, t) wherein a squared stone-shaped geometrical shape or cube-shape form of the cell appears preferably, see page 16 for example.

However, the terms for cube cells are not described in such a manner in the specification as parallelepiped shaped cubes to be readily identified as such for support of the wording for "parallelepiped" as found in the claims.

Appropriate correction to identify the parallelepiped-shaped cube cells for support in the specification is required. No new matter may be added.

Quayle Action

7. This application is in condition for allowance except for the following formal matters:

I. The abstract needs to be placed on a single page.

II. Corrections for the misspelled wording found in the claim limitations for "parallel-e-Piped" data needs correction and clarification.

III. The specification identifies cube and sub-cube point data that is not associated with the geometrical term for "parallelepiped" data wording as found in the claim limitations. The prior art above, Art-A and Art-B clearly identify cube and sub-cube data as geometric "Parallelepiped" point data and the term is commonly associated with the cube and sub-data in the art as indicated in the cited art above. Correction is required. No new matter may be added.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 25 USPQ 74, 453 O.G. 213, (Comm'r Pat. 1935).

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Allowable Subject Matter

8. Claims 1-30 are allowed.

9. The following is a statement of reasons for the indication of allowable subject matter:

Wherein claim 1, a method for seismic exploration with steps for processing seismic trace data wherein the seismic trace data represent a 3-D volume data traces with steps for dividing the 3-D data (cube) into a plurality of 3-D sub-volumes (sub-cubes) with steps for selecting dip data values and azimuth data values wherein the steps for dividing the 3-D volume into a plurality of parallel data cubes wherein the plurality parallelepiped cube data sets and being tilted by the selected dip values and rotated by the selected azimuth data value with steps for each parallelepiped data set halved to further obtain the two half-parallelepiped geometric data set with processes for enumerating the data to

obtain two vectors and with processes for edge detection calculations from the processed vector data with steps to obtain the sub results and filtering the sub result data sets by convolving the second sub result with the tilted and rotated directional filter kernel with further processes for selecting values and applying a 3-D skeletonization algorithm to the maximum value to obtain and generate a skeleton representing the fault surface and with steps for executing a maximum filtered value to obtain a plurality of fault skeletons and with the steps for labeling each of the plurality of distinct fault skeletons as a separated geological feature is not found in the cited art of record.

It is for these reasons and the particular claimed combination of limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 2-29 are dependent on the allowed independent claim 1 and are allowed at least for the reasons cited above.

Wherein claim 30, an apparatus for processing and analyzing seismic trace data comprising means to obtain and process seismic data with steps wherein the seismic trace data represent a 3-D volume data traces with steps for dividing the 3-D data (cube) into a plurality of 3-D sub-volumes (sub-cubes) with steps for selecting dip data values and azimuth data values wherein the steps for dividing the 3-D volume into a plurality of parallel data cubes wherein the plurality parallelepiped cube data sets and being tilted by the selected dip values and rotated by the selected azimuth data value with steps for each parallelepiped data set halved to further obtain the two half-parallelepiped geometric data set

with processes for enumerating the data to obtain two vectors and with processes for edge detection calculations from the processed vector data with steps to obtain the sub results and filtering the sub result data sets by convolving the second sub result with the tilted and rotated directional filter kernel with further processes for selecting values and applying a 3-D skeletonization algorithm to the maximum value to obtain and generate a skeleton representing the fault surface and with steps for executing a maximum filtered value to obtain a plurality of fault skeletons and with the steps for labeling each of the plurality of distinct fault skeletons as a separated geological feature is not found in the cited art of record.

It is for these reasons and the particular claimed combination of limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Victor J. Taylor
Examiner
Art Unit 2863.

John Barlow
Supervisory Patent Examiner
Technology Center 2800